



Application No: GB 9902476.2
Claims searched: 1-16

Examiner: Paul Jenkins
Date of search: 25 March 1999



Patents Act 1977
Search Report under Section 17

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FEB 6 2003
TC 1700

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): F4T (TGBX)

Int Cl (Ed.6): C03B 37/014; F23C 1/08

Other: Online: WPI, EPODOC, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	US 4810189 (MIKAMI) Whole document especially inlet 9 in figure 2	1-3, 6-7 & 10-11
X	US 4440558 (NATH) Figure 2	1 & 4

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TECHNOLOGY CENTER R3700

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year)

03 October 2000 (03.10.00)

International application No.

PCT/GB00/00332

Applicant's or agent's file reference

P23141A/VSL/CLF/PPP

International filing date (day/month/year)

07 February 2000 (07.02.00)

Priority date (day/month/year)

05 February 1999 (05.02.99)

Applicant

DA SILVA MARQUES, Paulo, Vicente et al

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

04 September 2000 (04.09.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

Juan Cruz

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P23141A/VSL/CLF/PPP	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB00/00332	International filing date (<i>day/month/year</i>) 07/02/2000	Priority date (<i>day/month/year</i>) 05/02/1999	
International Patent Classification (IPC) or national classification and IPC C03B19/14			
Applicant THE UNIVERSITY COURT OF THE UNIVERSITY OF...et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 8 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 04/09/2000	Date of completion of this report 25.05.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Stroud, J Telephone No. +31 70 340 3163



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/00332

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-9 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB00/00332

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 3-14,16.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 16 are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☒ the claims, or said claims Nos. 3-14 are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00332

	No:	Claims	1,2,15
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1,2,15
Industrial applicability (IA)	Yes:	Claims	1,2,15
	No:	Claims	

2. Citations and explanations
see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/00332

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The subject-matter of claim 16 is not clear due to reference to the description and drawing 3; the requirements of Article 6 PCT and Rule 6.2(a) PCT are not met (see point 3 of Item VIII below). The lack of clarity is such that no opinion in respect of Article 33(1) PCT can be formulated.
2. The subject-matter of claims 1-14 are inadequately supported by the description such that a complete and meaningful opinion w.r.t. Article 33(1) PCT could not be formed. Support is not present for the claims across the breadth of their presently broad definition (see section VIII below). A meaningful opinion, although incomplete, has been formed for claims 1,2,15 (see section V below).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:
D1: PATENT ABSTRACTS OF JAPAN vol. 6, no. 35, (1982-03-03), abstract of JP 56 155034 A (NT&T CORP.), 1 December 1981.
D2: PATENT ABSTRACTS OF JAPAN vol. 4, no. 151, (1980-10-23), abstract of JP 55 095638 A (HITACHI LTD.), 21 July 1980.
2. With reference to the restriction mentioned above in Section III; the application does not meet the requirements of Article 33(1) PCT in the sense of Article 33(2) PCT for the following reasons:-
 - 2.1. Document D1 discloses a burner for synthesizing and depositing glass particles using an atomiser producing an aerosol stream suitable for producing doped waveguides. The burner comprises many concentric ports and conduits, in particular a central inlet port and corresponding central conduit for the liquid feed to produce the aerosol. The reservoir 26 has an associated chamber between parts 26 and 26a which is suitable to function as a "gas expansion chamber",

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/00332

given the broad technical meaning that may be reasonably assigned to the latter expression.

Consequently, the subject-matter of claims 1, 2 and 15 of the present application is not new.

- 2.2. Independently of the opinion above in point 2.1, document D2 similarly discloses a burner suitable for aerosol doped deposition, comprising inlet ports 3,5,7, of which nozzle 5' delivering the liquid enters chamber 10 is suitable to function as a reservoir and "gas expansion chamber".

Consequently, the subject-matter of claims 1, 2 and 15 of the present application is not new w.r.t. document D2.

- 2.3. Claims which do not meet the requirements of novelty cannot meet the requirements of inventive step. Thus claims 1,2,15 do not meet the requirements of Article 33(1) PCT in the sense of Article 33(3) PCT.

- 2.4. Claims 1,2,15 meet the requirements of Article 33(1) PCT in the sense of Article 33(4) PCT, as the burner may be used in the manufacture of doped glass optical waveguides.

Re Item VI

Certain documents cited

Certain published documents (Rule 70.10)

Application No

Patent No

Publication date

(day/month/year)

Filing date

(day/month/year)

Priority date (valid claim)

(day/month/year)

EP 0 978 486 A

09/02/2000

25/06/1999

07/08/1998

This document would appear to be prejudicial to the novelty of at least claim 1 of the present application (see figure 4) w.r.t. regional/national phase of PCT procedure.

Re Item VII

Certain defects in the international application

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.
- 1.1. A document reflecting the prior art described on page 2, lines 11-12, is not identified in the description (Rule 5.1(a)(ii) PCT).

Re Item VIII

Certain observations on the international application

1. Claims 1-14 are not fully supported by the description as required by Article 6 PCT, as their scope is broader than that which may be considered reasonably justified by the contribution to the art as disclosed by the description and drawings. The reasons therefor are the following:
Support and disclosure is only present for a burner as defined in claim 1 in combination with the features of claims 2 and 15, namely that the "gas expansion chamber" of the "at least one inlet port" is in the form of a reservoir chamber suitable for providing a liquid dopant solution in the form of aerosol droplets to the associated torch conduit. This is clear from the description where the applicant describes the modification made to known prior art burners and the problem solved thereby as well as from the specific embodiments and figures related thereto (cf. page 1, lines 5-10; page 2, lines 11-23; page 6, line 9 to page 7, line 20 w.r.t. figure 3). Reference is made to Section III above.
- 1.1 It follows from 1. immediately above that the said features "reservoir" and "suitable for providing aerosol ..." are essential to the definition of the invention; otherwise the desired technical effect will not be present and so the technical problem not solved.
By omitting these features, independent claim 1 does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT, that any independent claim must contain all the technical features essential to the definition of the invention.
2. Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate (as implied from the

statement by the applicant in the description, i.a. on page 1, lines 6-7), with those features known in combination from the prior art (e.g. document D1 or D2) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

- 2.2. By not using the two-part form for the independent claim combined with not citing any relevant prior art in the description, the requirements of Article 6 PCT taken in combination with Rule 6.3 PCT and Rule 5.1(a)(ii)&(iii) are not met (see the PCT Guidelines, III-2.3a), for it is not clear what the contribution to the art is, without placing undue burden on the skilled reader.
3. Claim 16 contains only references to the description and the drawings. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here. The claim should be deleted.
4. The vague and imprecise statement in the description on page 9, lines 19-24 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, III-4.3a).
The statement should be deleted.
5. Many of the claims for a burner are defined at least in part by terms of its function or intended use, e.g. claims 1,2,6-9,15. Lack of clarity results because the intended scope w.r.t. the burner is not clearly defined, contrary to the requirements of Article 6 PCT.

REC'D 29 MAY 2001

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P23141A/VSL/CLF/PPP	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/00332	International filing date (day/month/year) 07/02/2000	Priority date (day/month/year) 05/02/1999
International Patent Classification (IPC) or national classification and IPC C03B19/14		
Applicant THE UNIVERSITY COURT OF THE UNIVERSITY OF...et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 8 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 04/09/2000	Date of completion of this report 25.05.2001
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Stroud, J Telephone No. +31 70 340 3163 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00332

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-9 as originally filed

Claims, No.:

1-16 as originally filed

Drawings, sheets:

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00332

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 3-14,16.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 16 are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☒ the claims, or said claims Nos. 3-14 are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00332

	No:	Claims	1,2,15
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1,2,15
Industrial applicability (IA)	Yes:	Claims	1,2,15
	No:	Claims	

2. Citations and explanations
see separate sheet

VI. Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/00332

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The subject-matter of claim 16 is not clear due to reference to the description and drawing 3; the requirements of Article 6 PCT and Rule 6.2(a) PCT are not met (see point 3 of Item VIII below). The lack of clarity is such that no opinion in respect of Article 33(1) PCT can be formulated.
2. The subject-matter of claims 1-14 are inadequately supported by the description such that a complete and meaningful opinion w.r.t. Article 33(1) PCT could not be formed. Support is not present for the claims across the breadth of their presently broad definition (see section VIII below). A meaningful opinion, although incomplete, has been formed for claims 1,2,15 (see section V below).

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:
D1: PATENT ABSTRACTS OF JAPAN vol. 6, no. 35, (1982-03-03), abstract of JP 56 155034 A (NT&T CORP.), 1 December 1981.
D2: PATENT ABSTRACTS OF JAPAN vol. 4, no. 151, (1980-10-23), abstract of JP 55 095638 A (HITACHI LTD.), 21 July 1980.
2. With reference to the restriction mentioned above in Section III; the application does not meet the requirements of Article 33(1) PCT in the sense of Article 33(2) PCT for the following reasons:-
 - 2.1. Document D1 discloses a burner for synthesizing and depositing glass particles using an atomiser producing an aerosol stream suitable for producing doped waveguides. The burner comprises many concentric ports and conduits, in particular a central inlet port and corresponding central conduit for the liquid feed to produce the aerosol. The reservoir 26 has an associated chamber between parts 26 and 26a which is suitable to function as a "gas expansion chamber",

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/00332

given the broad technical meaning that may be reasonably assigned to the latter expression.

Consequently, the subject-matter of claims 1, 2 and 15 of the present application is not new.

- 2.2. Independently of the opinion above in point 2.1, document D2 similarly discloses a burner suitable for aerosol doped deposition, comprising inlet ports 3,5,7, of which nozzle 5' delivering the liquid enters chamber 10 is suitable to function as a reservoir and "gas expansion chamber".

Consequently, the subject-matter of claims 1, 2 and 15 of the present application is not new w.r.t. document D2.

- 2.3. Claims which do not meet the requirements of novelty cannot meet the requirements of inventive step. Thus claims 1,2,15 do not meet the requirements of Article 33(1) PCT in the sense of Article 33(3) PCT.

- 2.4. Claims 1,2,15 meet the requirements of Article 33(1) PCT in the sense of Article 33(4) PCT, as the burner may be used in the manufacture of doped glass optical waveguides.

Re Item VI

Certain documents cited

Certain published documents (Rule 70.10)

Application No			
Patent No	Publication date	Filing date	
(day/month/year)			
(day/month/year)	Priority date (valid claim)		
(day/month/year)			
EP 0 978 486 A	09/02/2000	25/06/1999	07/08/1998

This document would appear to be prejudicial to the novelty of at least claim 1 of the present application (see figure 4) w.r.t. regional/national phase of PCT procedure.

Re Item VII

Certain defects in the international application

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB00/00332

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.
- 1.1. A document reflecting the prior art described on page 2, lines 11-12, is not identified in the description (Rule 5.1(a)(ii) PCT).

Re Item VIII

Certain observations on the international application

1. Claims 1-14 are not fully supported by the description as required by Article 6 PCT, as their scope is broader than that which may be considered reasonably justified by the contribution to the art as disclosed by the description and drawings. The reasons therefor are the following:
Support and disclosure is only present for a burner as defined in claim 1 in combination with the features of claims 2 and 15, namely that the "gas expansion chamber" of the "at least one inlet port" is in the form of a reservoir chamber suitable for providing a liquid dopant solution in the form of aerosol droplets to the associated torch conduit. This is clear from the description where the applicant describes the modification made to known prior art burners and the problem solved thereby as well as from the specific embodiments and figures related thereto (cf. page 1, lines 5-10; page 2, lines 11-23; page 6, line 9 to page 7, line 20 w.r.t. figure 3). Reference is made to Section III above.
- 1.1 It follows from 1. immediately above that the said features "reservoir" and "suitable for providing aerosol ..." are essential to the definition of the invention; otherwise the desired technical effect will not be present and so the technical problem not solved.
By omitting these features, independent claim 1 does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT, that any independent claim must contain all the technical features essential to the definition of the invention.
2. Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate (as implied from the

statement by the applicant in the description, i.a. on page 1, lines 6-7), with those features known in combination from the prior art (e.g. document D1 or D2) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

- 2.2. By not using the two-part form for the independent claim combined with not citing any relevant prior art in the description, the requirements of Article 6 PCT taken in combination with Rule 6.3 PCT and Rule 5.1(a)(ii)&(iii) are not met (see the PCT Guidelines, III-2.3a), for it is not clear what the contribution to the art is, without placing undue burden on the skilled reader.
3. Claim 16 contains only references to the description and the drawings. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here. The claim should be deleted.
4. The vague and imprecise statement in the description on page 9, lines 19-24 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them (see also the PCT Guidelines, III-4.3a).
The statement should be deleted.
5. Many of the claims for a burner are defined at least in part by terms of its function or intended use, e.g. claims 1,2,6-9,15. Lack of clarity results because the intended scope w.r.t. the burner is not clearly defined, contrary to the requirements of Article 6 PCT.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
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BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
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BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
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CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

Inter. Application No

PCT/GB 00/00332

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C03B19/14 F23D14/32 F23D14/22

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C03B F23D F23J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	EP 0 978 486 A (CORNING INC.) 9 February 2000 (2000-02-09) claims 11,12; figures 1-5	1
X	PATENT ABSTRACTS OF JAPAN vol. 6, no. 35, 3 March 1982 (1982-03-03) -& JP 56 155034 A (NT&T CORP.), 1 December 1981 (1981-12-01)	1-3
A	abstract; figures 2A,2B	6,7, 9-11,15
X	PATENT ABSTRACTS OF JAPAN vol. 4, no. 151, 23 October 1980 (1980-10-23) & JP 55 095638 A (HITACHI LTD.), 21 July 1980 (1980-07-21)	1,2,5, 10,11
A	abstract	6,9,15
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

5 April 2000

Date of mailing of the international search report

13.04.00

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Stroud, J

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 00/00332

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PATENT ABSTRACTS OF JAPAN vol. 16, no. 176, 27 April 1992 (1992-04-27) & JP 04 021536 A (HITACHI CABLE LTD.), 24 January 1992 (1992-01-24) abstract ----	1,12,15
A	WO 97 22553 A (CORNING INC.) 26 June 1997 (1997-06-26) claims 12-19; figures 1,4 ----	1,15
A	EP 0 463 783 A (AT&T CO.) 2 January 1992 (1992-01-02) figure 3 ----	1
A	EP 0 160 858 A (LICENTIA PATENT-VERWALTUNGS-GMBH) 13 November 1985 (1985-11-13) claims 1-8; figures 1-3 -----	1

INTERNATIONAL SEARCH REPORT

In international application No.
PCT/GB 00/00332

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 1-16 relate to a large number of possible burner configurations. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the burner configurations claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is not possible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to burner configurations including a "gas expansion chamber" in the inlet port suitable for providing an aerosol to said burner and located upstream of the said gas mixing region.

The search has covered burner configurations of the general type defined in claim 1 and which are suitable for use with an aerosol delivery and where the gas expansion chamber is located in the inlet port or feed line intended to be used for feeding an aerosol, whether the aerosol is a dopant or glass forming material (refer also to claim 15).

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 00/00332

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